

BC's Coast Region: Species & Ecosystems of Conservation Concern

Oregon Spotted Frog (*Rana pretiosa*)

Global: G2 Provincial S1: COSEWIC: E BC List: Red

Eye laterally upturned, pupil visible from above



Adult dorsal colouration



Adult ventral colouration, hind feet fully webbed

Notes on *Rana pretiosa*: A member of the family Ranidae (“true frogs”), which has the widest distribution of any frog family. Most members of this family have smooth, moist skin, large, powerful legs and extensively webbed feet. Oregon Spotted Frog was originally grouped with its close relative, Columbia Spotted Frog, a much more common and widely distributed species, however the two distinct species were recognized in 1979. Neither species has overlapping ranges in BC. While Columbia Spotted Frog populations appear somewhat stable, Oregon Spotted Frog have shown significant declines across their entire Pacific Northwest range in North America.

Description

Snout to vent length 6-9 cm, females larger than males.

Dorsal colour of adults ranges from reddish-brown to tan or olive with irregular-shaped black spots with light centers. An extensive, light-coloured stripe down extends along the upper lip to the shoulder. Light brown to orange “dorsolateral” folds extend from behind the eyes to the middle of back. Hind legs have black, mottled striping or blotching. Ventral colouration ranges from cream on the lower jaw transitioning to a rust orange colour on the chest, belly, upper and lower legs all the way to tips of the toes. Some individuals have heavy olive mottling throughout the ventral areas with only small amounts of rust colouration on the ventral area of each leg. No mottling is found in the groin areas. Webbing on the hind feet is extensive, extending to almost the tip of each toe. Unlike other members of its genus, Oregon Spotted Frog have relatively short hind legs. Males develop a “nuptial pad” on each thumb to assist in gripping females (“amplexus”) during breeding. The snout is pointed and eyes are turned upward laterally. Juveniles are olive-green or light brown and lack the bright ventral colouration, large spots and blotches on the hind legs. The olive-brown tadpoles have a long tail, about twice the length of the body, with a colourless tailfin containing scattered flecks. The belly is white or slate in colour and small raised bumps occur on the side.



Metamorphosing tadpoles

Diet

An opportunistic feeder, this species feeds while floating at the surface, consuming a wide variety of insects as well as snails, freshwater shrimp, spiders. In Oregon adults have been known to predate on juvenile Western Toad. Tadpoles graze on algae, organic debris and plant tissue.

Look's Like?

Oregon Spotted Frog share distribution with other native and nonnative “Ranid” frogs including Northern Red-legged Frog, Green Frog and Bullfrog. Both Oregon Spotted Frog and Northern Red-legged Frog have brightly coloured ventral areas¹. Northern Red-legged Frog tends to be a distinct bright red while Oregon Spotted Frog is more of a dark, rust-orange colour. Northern Red-legged



Eye not laterally upturned, pupil not visible from above

Toes not fully webbed

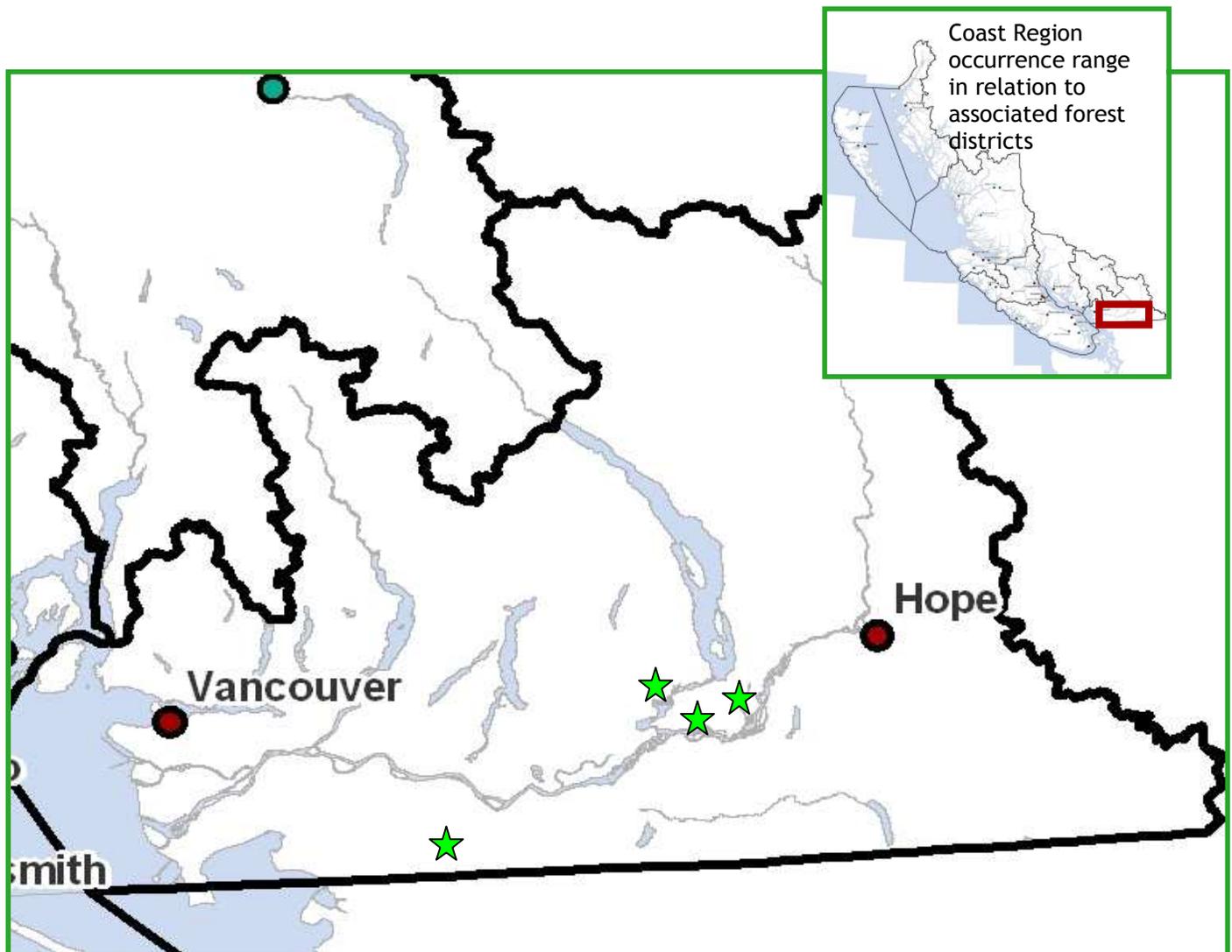
Northern Red-legged Frog (juvenile)

¹ See Northern Red-legged Frog factsheet.

Frog tadpoles have yellow to washed out red bellies with gold flecks while Oregon Spotted Frog tadpoles have white or slate coloured bellies. Oregon Spotted Frog tends to sit with its belly low to the ground while most other Ranid species sit upright. The upturned eyes and extensive webbing on the hind feet are key diagnostics for Oregon Spotted Frog and unlike Northern Red-legged Frog, Oregon Spotted Frog is rarely found far from water. Skin on legs is opaque, as opposed to RLF where skin is transparent with muscles / bones visible through skin.

Distribution

<50m (unlikely to occur over 200m in BC, found up to 1700m in Oregon). It is estimated that Oregon Spotted Frog populations have declined 70-90% across their entire range (Oregon, Washington and extreme southwest of BC), and are extirpated from California. In BC, where this species is restricted to a handful of disjunct populations in the Fraser Lowlands on the Coast Region, this trend is similar with at least 50% of populations having become extirpated. However this may be closer to 90% as many populations may have gone unreported historically. Present occurrences are known from the Salmon River headwaters area (Langley/Aldergrove), Maria Slough (Seabird Island), Mountain Slough (District of Kent), and Morris Valley (District of Kent). Three known extirpated populations occurred in Campbell Valley Regional Park (Langley), Nicomen Island and Sumas Prairie (Chilliwack). Captive breeding programs have been underway for a number of years in Langley and Aldergrove. Release programs to existing and restored sites on Seabird Island and Aldergrove have been ongoing since 2003 with goals to establish approximately 20 viable populations in BC.



Oregon Spotted Frog (*Rana pretiosa*), known occurrence range for the Coast Region.

Habitat Preferences

Oregon Spotted Frog are typically associated with medium to large wetlands (>4 ha), that are shallow, slow moving and support abundant native emergent vegetation (e.g. species of grasses, sedge and rush). Slow moving streams and sloughs with sufficient vegetation attributes may also be used. Mixed forests are often found in association with upland perimeter areas. In Washington, frogs moved to deeper permanent pools during dry periods. During cold periods or when ice cover occurs, frogs will burrow into soft substrate at the base of vegetation. Oregon Spotted Frog may venture into adjacent forests or shrub thickets when water levels are high and surrounding areas have moist saturated soils.



Critical Features

Water temperature is a key factor in habitat use, most populations are found in wetland complexes that warm substantially during periods when frogs are most active at the surface (spring through fall), though activity may begin in late winter at temperatures as low as -5 °c.

Wetlands that cover larger areas tend to support larger frog populations. Different areas within a wetland appear to be used for breeding and non-breeding. Breeding sites are generally associated with seasonally flooded, shallowly sloping benches that are vegetated with the previous year's emergent vegetation and have low shade.

While shallow wetlands are often subject to seasonal fluctuations in inundation levels, those that support Oregon Spotted Frog populations typically have a component of permanent water.

Seasonal Life Cycle

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
		Courtship / Spawning										
		Tadpoles May-July Juveniles emerge July-Aug.										
											Overwinter underwater	

Adult females lay a single egg mass per year. Eggs are laid communally during mid-afternoon and at night, sometimes on top of each other.

Threats

- ◆ Distribution coincides with areas undergoing significant urbanization and natural habitat loss including draining and infilling of wetlands and hydrological disruption to surface and groundwater from adjacent development and land use.
- ◆ This species has a strong association with large shallow wetlands with specific vegetation and micro-habitat qualities which have limited occurrence in the species present range in BC. Breeding behavior that selects for shallow water results in vulnerability to fluctuating water levels that contribute to both stranding and washing away of egg masses and substantial egg mortality. This may become an increasing issue in the future from climate change impacts.
- ◆ Dispersal abilities are limited and all remaining populations are small and highly isolated from one another.
- ◆ Roadways that cut through core habitat areas can disrupt hydrological processes as well as increasing population fragmentation.
- ◆ Predation by introduced Bullfrog and potential competition impacts from Green Frog.
- ◆ Infilling of wetlands and reduction in native plant community complexity by non-native plant species (e.g. species of reed canary grass).
- ◆ Cumulative impacts from disease. Chytridiomycosis, caused by the chytrid fungus *Batrachochytrium dendrobatidis*, has been linked to dramatic population declines or even extinctions of amphibian species in western North America and has

been found to occur widely in US Oregon Spotted Frog populations, especially those at lower elevations. Impacts and risks to the species as a whole from this fungus are unknown.

- ◆ This species appears highly sensitive to water chemistry (i.e. conductivity), especially during embryonic development and may require specific conditions for optimal reproductive success.
- ◆ As with most amphibians, Oregon Spotted Frog easily absorbs contaminants through their skin. Direct mortality or sub-lethal impacts throughout all life history phases can occur from fertilizer and pesticide applications in urban and agricultural areas as well as for silviculture management.

Conservation & Management Objectives

- ◆ Apply conservation and management objectives as set out in “Recovery strategy for the Oregon Spotted Frog (*Rana pretiosa*) in British Columbia” and the “BMP for Amphibians and Reptiles in Urban and Rural Environments in British Columbia”. Consider complimentary objectives found in “A Conservation Assessment for the Oregon Spotted Frog (*Rana pretiosa*) through the USDA Forest Service Region 6 and USDI Bureau of Land Management, Oregon and Washington.
- ◆ Inventory and monitor using standardized methods (Resource Information Standards Committee) # 37 Inventory Methods for Pond-breeding Amphibians and Painted Turtle (Version 2.0)².

Specific activities should include:

- ◆ Protect existing native emergent marsh vegetation complexes in presently occupied sites and restore plant communities impacted by non-native plant species.
- ◆ Manage occupied and potential reintroduction sites to maintain early successional stages necessary to maintain optimal breeding and overwintering features.
- ◆ Monitor Oregon Spotted Frog population responses to various management regimes as well as changes to land use and land cover in areas adjacent to occupied sites.
- ◆ Monitor and manage for impacts from Bullfrog predation.
- ◆ Collect information on population trends, including a monitoring plan for individual sites and watersheds and studies to monitor population responses to habitat restoration, reintroductions, and the impacts of translocation on populations³.
- ◆ Maintain sufficient permanent buffers, at least 45 metres from the outer highest seasonal wetted perimeter of occupied sites to protect life history requirements. Riparian buffers used to protect fisheries values will likely be inadequate. Additional buffers may be needed to adequately protect wetland hydrology and reduce potential impacts from pesticide and nutrient runoff from agricultural activities.
- ◆ Encourage landowners to create conservation covenants to buffer wetlands (permanent and seasonal) and riparian habitat on their property. Monitor the effectiveness of conservation agreements and the actions associated with them.
- ◆ Urban and agricultural runoff should be appropriately managed to reduce contaminants enter receiving waters. Maintain septic fields and any other potential sources of contamination to surface and ground water that may be sustaining local wetland systems.
- ◆ Employ integrated pest management approaches that reduce the need for chemical applications in urban, agricultural and silviculture practices.

This species is listed under the Federal Species At Risk Act (SARA) and may be subject to protections and prohibitions under the BC Wildlife Act. Habitat for this species may also be governed under provincial and federal regulations including the Fish Protection Act and Federal Fisheries Act as well as Regional and local municipal bylaws.

Content for this Factsheet has been derived from the following sources

BC Conservation Data Centre. 2011. [Internet] [Updated March 14 2005] Conservation Status Report: *Rana pretiosa*. BC MoE.
BC Frogwatch Program. 2010. [Internet] Environmental Stewardship Division. BC Ministry of Environment
BC Ministry of Environment. 2012. [Internet] Canadian Oregon Spotted Frog Recovery Team. 2012. Recovery strategy for the Oregon Spotted Frog (*Rana pretiosa*) in British Columbia. Victoria, BC. 59 pp.
BC Ministry of Environment Lands and Parks. Resources Inventory Branch 1998. [Internet] Inventory Methods for Pond-breeding Amphibians and Painted Turtle (Version 2.0). Standards for Components of British Columbia's Biodiversity No. 38.
California Herps.com 2011. [Internet] Oregon Spotted Frog *Rana pretiosa*

² Other approaches to inventorying and monitoring such as those found in “Measuring and Monitoring Biological Diversity - Standard Methods for Amphibians”, “Suitability of Amphibians and Reptiles for Translocation” and amphibian survey methodologies developed for the “Wetlandkeepers Handbook” are recommended.

³ Relocation and translocation should not be a first choice mitigation or compensation option to avoid land use impacts.

Haycock, R.D. 2000. COSEWIC status report on the Oregon spotted frog *Rana pretiosa* in Canada, in COSEWIC assessment and status report on the Oregon spotted frog *Rana pretiosa* in Canada 1-22 pp.

Cushman, Kathleen. A and Christopher A. Pearl. 2007. [Internet] A Conservation Assessment for the Oregon Spotted Frog (*Rana pretiosa*). March 2007, USDA Forest Service region 6

Germano, J.M. and P.J. Bishop. 2008. [Internet] Suitability of Amphibians and Reptiles for Translocation. Conservation Biology 23:7-15.

Hayes, Mark P. et al. 2009. [Internet] Amphibian Chytridiomycosis in the Oregon Spotted Frog (*Rana pretiosa*) in Washington state USA. Northwestern Naturalist 90:148-151

Hayes, Mark P. et al. 2005. [Internet] Exploratory Evaluation of Nutrient Enrichment and Frog Response at Conboy Lake National Wildlife Refuge. Environmental Contaminants On-Refuge Investigation Project ID: 1N56

Heyer, W.R., et al. 1994. Measuring and Monitoring Biological Diversity. Standard Methods for Amphibians. Smithsonian Institution Press, Washington.

Matsuda, B.M. 2002. [Internet] The Wetlandkeepers Handbook: Section 5, Module 2.4. Conducting an Amphibian Inventory. BC Wildlife Federation, Surrey, BC

McKibbin R, et al. 2008. The influence of water quality on the embryonic survivorship of the Oregon Spotted Frog (*Rana pretiosa*) in British Columbia, Canada. Science of the Total Environment. 395: 28-40

Nathan, D. et al. 2007. [Internet] Oregon Spotted Frog (*Rana pretiosa*) Movement and Demography at Dilman Meadow: Implications for Future Monitoring. USGS Forest and Rangeland Ecosystem Science Center.

Olson, D.H., Leonard, W.P., Bury, R.B. 1997. Sampling Amphibians in Lentic Habitats: Methods and Approaches for the Pacific Northwest. Northwest Fauna Number 4. Society for Northwestern Vertebrate Biology, Olympia, WA.

Oregon Fish and Wildlife Office. 2011. [Internet] Species Fact Sheet Oregon spotted frog *Rana pretiosa*.

Ovaska, Kristiina et al. 2004. [Internet] Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia. BC Ministry of Water, Land and Air Protection. Nanaimo.

Pearson, Monica. 2010. [Personal comm.] South Coast Oregon Spotted Frog Recovery Project. BC Conservation Foundation.

Sielecki, Leonard E. 2010. [Internet] Wildlife identification field guide: red and blue listed amphibians and reptiles in British Columbia

Pearl, C. A, and M. P. Hayes. 2004. [Internet] Habitat associations of the Oregon spotted frog (*Rana pretiosa*): A literature review. Final Report. Washington Department of Fish and Wildlife, Olympia, Washington, USA.

Proulx, Gilbert et al. 2003. A Field Guide to Species at Risk in the Coast Forest Region of British Columbia. Published by International Forest Products and BC Ministry of Environment. Victoria (BC).

Washington Herp Atlas, 2009. [Internet] Oregon Spotted Frog *Rana pretiosa*. Washington Natural Heritage Program, Washington Dept. of Fish & Wildlife, U.S.D.I. Bureau of Land Management and US Forest Service

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